THE RELATION OF OFF-TASK BEHAVIOR TO PERFORMANCE AMONG EDUCABLE MENTALLY RETARDED, LEARNING DISABLED, AND NORMAL MIDDLE SCHOOL STUDENTS

BY

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Abstract of Dissertation Presented to the Graduate Council
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The purpose of this study was to examine the relationship between time off-task and performance. A second purpose of the study was to look at differences in off-task behavior between three ability groups during two separate phases (instruction and performance). The groups referred to were educable mentally retarded (EMR), learning disabled (LD), and normal middle school students.

Participants in this study ranged in age from 13 to 15 years. There were 10 students in each ability category for a total of 30 subjects. Subjects were randomly selected for data collection.

During the study, the researcher taught all participants a novel addition algorithm. This process was repeated the next day using a different but comparable addition procedure. At the end of the instructional period the subjects completed up to 45 problems using the newly

learned procedure. A videotape machine recorded the entire procedure.

Data were collected by observers viewing the videotapes. The observers were trained to record the number of seconds that a subject appeared to be off-task during each phase of the study. An inter-observer agreement, as estimated by a Pearson correlation coefficient of .80, was necessary to begin data collection. The actual achieved inter-observer agreement exceeded the .90 level.

The data were analyzed using a split-plot analysis of covariance (ANCOVA) and a 3x2 repeated measures analysis of variance (ANOVA). The ANCOVA procedure addressed the hypothesis that there was no relationship between time off-task and performance. The ANOVA procedure was used to answer the remaining hypotheses regarding phase and ability groups. All statistical procedures were tested at the .05 level of significance.

Results of the data analysis indicate that there was no relationship between time off-task and performance. Further, it was found that the EMR group differed significantly in off-task behavior during the performance phase. It was concluded that the EMR group was significantly more off-task than the LD or Normal groups.

Recommendations for future research called for replication with different aged subjects and further study in EMR off-task behavior. In addition, a recommendation for more longitudinal research on off-task behavior was made.

CHAPTER I

INTRODUCTION

On and off-task behaviors have been standard variables in many research studies involving achievement (Lomax, 1979; McDaniel, 1974; McKenzie, 1979; McKenzie & Henry, 1979; Rusnock & Brandler, 1979; Walker & Buckley, 1968; Walker & Hops, 1976; Wyne & Stuck, 1979). It has been assumed that these variables are indicators of whether or not learning, as defined by improved performance, has occurred. If a child is observed spending more time on-task than off-task, the assumption is that more learning has occurred. On the other hand, off-task behavior suggests that desired levels of learning are not taking place. Procedurally, on and off-task behavior has been determined by observing purely physical movements of subjects (Forness, 1973; Grannis, 1978; Lay, 1969; McDaniel, 1974; McKenzie, 1979; Nottelmann & Hill, 1975; Rusnock & Brandler, 1979; Stodolsky, 1979; Walker & Buckley, 1968; Wyne & Stuck, 1979). Such behavioral indices as eye gaze, head movement, doodling, talking, and moving about have been used in determining on and off-task behavior.

Several types of off-task behavior have been further identified by researchers. Cooper (1981) cited three types of off-task behaviors: verbal, motor, and passive. Using Cooper's definition,

verbal off-task behavior would be defined as inappropriate verbalizations, motor off-task behavior would be moving about the room or other inappropriate in-seat movements, and passive off-task behavior would be that of observing the subject being listless or doing nothing. On-task behaviors are often identified as having pencil to paper, eye gaze directed towards task, and appropriate verbalizations such as teacher directed questions. However, no effort has been made in past research to determine whether or not a subject appears off-task while actually engaging in on-task behaviors. This might occur when a subject looks away from the task and thinks about the solution to the problem. In such a case, the strict procedural definition, currently in use, of on and off-task behaviors might not accurately discriminate on a performance measure. The intent of this study was to observe off-task behaviors using conventional definitions of these behaviors during two separate phases and then analyzing the performance results by comparing them to time off-task. The two separate phases were an instructional phase and a performance phase. The instructional phase occurred when the instructor gave directions and examples of the upcoming performance task. The performance phase was when the task was actually being completed by the subjects. Differences between the ability groups on off-task behavior were also examined.

Implications of this study revolve around past, present, and future research practices involving observation of off-task behavior. The conventional forms of observation were confirmed as appropriate or seriously questioned as to their reliability.

Justification of the Study

Due to the fact that such a large number of past and present research studies have based their conclusions on observations of on and off-task behaviors, it is appropriate to attempt to determine the efficacy of the common observational techniques employed. While the techniques in question observe physical movements as an indicator of being either on or off-task, they fail to address the possibility that a child may appear off-task when actually engaging in on-task activities. For example, a child might be solving mathematical word problems and is observed looking away from the paper. Such a child is, by definition, manifesting off-task behavior, when, in fact, that child could be engaged in concentrated thought toward a solution to a particular word problem. Data collected in the above hypothetical example might well lead to spurious results and unreliable conclusions. Due to the potential for unreliable results and the large number of studies using on and off-task measures, there is ample justification for this study.

Statement of the Problem

The question the present study sought to answer was: Is there a relationship between time off-task and performance? A related question involved the amount of time off-task among the three ability groups of educable mentally retarded (EMR), learning disabled (LD), and Normal subjects.

Purpose

The primary purpose of this study was to investigate the efficacy of off-task observations as a determinant of student performance. Further, it was the purpose of the study to compare the differences of off-task behavior during the instruction and performance phases thereby making it possible to pinpoint the times when off-task behavior becomes a crucial element leading to success or failure.

Variables

The variables in question were time off-task and accuracy of performance. The relationship between these variables was studied although they were not specifically defined as an independent and dependent variable. However, for the sake of clarity, the independent variable was time off-task and the dependent variable was performance outcome. Other variables included IQ (which was considered as a covariate in the analysis), phase (i.e., instruction or performance), and group.

Questions

The following questions were examined in this study.

1. What is the nature of the relationship between time off-task and performance?

2. Will time off-task differ during the performance and instructional phases?

3. Will time off-task differ among the ability groups used in the study?

Definition of Terms

On-Task Behavior. Instructional phase: eye gaze directed toward the instructor, raising hand to ask questions, asking questions relevant to task (Grannis, 1978; Lay, 1969; McDaniel, 1974; Stodolsky, 1979; Walker & Buckley, 1968; Walker & Hops, 1976). Performance phase: pencil on paper, eye gaze directed toward task, raising hand to ask relevant questions (Cobb, 1972; Forness, 1973; Lay, 1969; Stodolsky, 1979).

Off-Task Behavior. Verbal: any verbalizations not directed toward instructor and not related to task such as whispering, looking away from task, and talking to other students about non-task related items (McDaniel, 1974; McKenzie, 1979; Rusnock & Brandler, 1979; Walker & Buckley, 1968). Motor: any out of seat behavior, doodling, directing eye gaze away from task, pencil not on paper in conjunction with off-task gaze (Cobb, 1972; Cooper, 1981; Forness, 1973; Nottelmann & Hill, 1975).

Learning. Knowledge or skill acquired by instruction (Webster's Dictionary, 1980).

Performance. Corrected results of problems done by students on the novel math tasks.

Instruction. The action, practice, or profession of a teacher utilizing examples over a period not to exceed one-half hour (Webster's Dictionary, 1980).

Observation. An act of recognizing and noting a fact or occurrence often involving measurement with instruments specifically videotape recording of subjects during instruction and performance phases (Reichard & Reid, 1969).

Educable Mentally Retarded (EMR). Those students meeting criteria for placement in a program for EMR youth as defined by the Bureau of Education of Exceptional Students (BEES), Florida Statutes number 228.041, the Department of Education, State of Florida, Alachua County (1979).

Learning Disabled (LD). Those students meeting criteria for placement in a program for LD youth as defined by the Bureau of Education of Exceptional Students (BEES), Florida Statutes number 228.041, the Department of Education, State of Florida, Alachua County (1979).

Normal Students. Those students in regular education not in need of an exceptional student program as defined by the Bureau of Education of Exceptional Students (BEES), Florida Statutes number 228.041, the Department of Education, State of Florida, Alachua County (1979).

Performance Phase. A 20 minute slot of time at the end of the period in which subjects attempted to complete novel math problems.

Instructional Phase. A 20 minute slot of time just prior to the performance phase in which instruction was provided by the researcher to the subjects for the purposes of explaining how the novel math problems are solved.

Delimitations

The population of subjects was randomly selected from the following public schools: Howard W. Bishop Middle School, Ft. Clarke Middle School, Lincoln Middle School, and Westwood Middle School. These schools are in Alachua County located in the north central part of the State of Florida. The grade levels were six through eight. In the event that any EMR or LD classes were not defined by grade level, the corresponding age levels determined selection (i.e., 12 to 16 years old). Sex of subjects was determined randomly in the overall subject selection in an attempt to assure a representative proportion of boys to girls as would normally be found in special education classes.

Limitations

This study was limited to children in the subject population (i.e., middle school EMR, LD, and Normal students). While it was recognized that some commonalities exist between school districts, the limited geographical area employed must still be viewed in the context of reduced generalizability of the results. Vagueness of the definition of the three subject populations, primarily LD, was seen as a limitation of the study. The novel math task was cited as a limitation due to the fact that it has potential for creating frustration in some subjects who may have trouble grasping the concepts presented. The presence of the camera could be cited as a limitation

even though research suggests that the effects are minimal (Reichard & Reid, 1969).

Further limitations of this study revolve around socioeconomic status (SES), sex of subjects, and the type of task. SES and sex of subjects were not considered variables under study and thus comprise limitations to the study. Random selection should have helped control for these factors, but future researchers might wish to consider them more closely. The type of task chosen was a novel math task but a reading or other academic task could have produced different results.

A final limitation refers to the length of time of instruction in the novel math task. Some children could conceivably have a great deal of difficulty learning a new task in this short period of instructional time. Further, data collected over a short period of time (i.e., 20 minutes per subject) is cited as a limitation and, as such, has a potential ceiling effect in that some subjects could have finished all problems within the 20 minute period.

Summary

Past research efforts involving on and off-task behaviors and the observation of those behaviors have traditionally used physical movements as indicators of on and off-task behavior. However, a Problem with this approach involves the possibility that some middle school students may appear off-task while, in fact, engaging in a solution to the task. The present study was an attempt to determine the magnitude of the above possibility.

CHAPTER II

REVIEW OF THE LITERATURE

This chapter reviews the existing literature regarding on and off-task behavior. Surprisingly, the researcher found a serious shortage of off-task related literature concerning handicapped children.

The main thrust of this chapter is to systematically present substantive and methodological issues regarding on and off-task behaviors as presented in the literature. An objective approach by the researcher was seen as necessary to help insure the overall quality of the study.

Literature involving on and off-task behaviors covers a wide range of topics. In order to maintain relevance to the present study, the following topics were detailed:

(1) teacher effects,

(2) student achievement,

(3) definition of on and off-task behavior, and

(4) anxiety.

These topics were chosen because they were the most prevalent topics in the literature regarding on and off-task behavior in educational situations.

It must be noted that some studies mentioned herein focus on children in grade levels that differ from those used in the present study. This constitutes a problem of generalizability of results since subjects in different levels represent different populations.

Teacher Effects

Several studies have observed on and off-task behavior as it relates to the behavior of teachers (Borg, Langer, & Wilson, 1975; Davidson & Bell, 1975; Fisher, Marliave, Filby, Cahen, Moore, & Berliner, 1976; Forness, 1973; Fox, 1978; Lomax, 1979). On and off-task behavior by students is seen as an indicator of teacher quality.

Lomax (1979) suggested using time on-task as an indicator of instructional time rather than teacher logs. He came to this conclusion after reviewing 10 studies on achievement in math and reading as they related to instructional time. The studies Lomax reviewed revealed that time on-task variables more accurately predict instructional time than did teacher logs.

In a report to the California Commission for Teacher Preparation and Licensing, Fisher et al. (1976) compared teacher effectiveness on measures of student engaged time. Several weaknesses are evident in this report. Engaged time, for instance, was only tallied when the teacher was in actual contact with a particular student. Further, Fisher admits that distinctions of on and off-task behaviors were crude. However, the commission accepted Fisher's report as part of

its Beginning Teacher Evaluation Study (BTES) which helps to establish teacher certification standards in the state of California. This gives the reader some indication of the powerful influence that research of on and off-task performance can have on teachers.

Researchers have suggested that measures of on and off-task behaviors relate directly to classroom management skills. Borg et al. (1975) conducted an experiment with 29 elementary school teachers in which there was an experimental and a control group. There were no random assignment of teachers to groups and most came from the same school. The experimental group was given an extensive course in classroom management while the control group received no intervention. The measure of whether or not the experimental intervention had been successful was pupil on-task behavior. The authors concluded that their intervention had been successful because those teachers in the experimental group exhibited more pupil time on-task than teachers in the control group.

Those studies mentioned earlier in this section simply state that there is a relationship between time on-task and teacher performance. However, they present weak arguments for crude definitions and experimental contamination. Other groups of researchers offer much more plausible reasons for the positive relationship between time on-task and teacher performance.

Davidson and Bell (1975) found that teachers who have a high percentage of direct contact with students have students who exhibit a high degree of on-task behavior. This is further substantiated by

the findings of Forness (1973) that teachers responded more to students who exhibited high on-task behavior. Forness concluded that on-task behavior by the student is highly reliant on the teacher. Therefore, these researchers seem to be saying that a student who appears to be on-task is likely to gain the teacher's attention and, in order to maintain a high level of on-task behavior, the teacher must respond to that student. It is a well known educational premise that most students seek teacher attention. Unfortunately, the majority of literature focuses on disruptive attention rather than on-task behavior. The idea of attending to good behavior (i.e., on-task) is well thought of by behaviorists but fails to get the publicity that disruptive behavior receives. Cawelti (1980), at a meeting of the American Association of School Administrators in Anaheim, California, suggested hiring teachers who can keep children on-task.

A final study that attempted to measure teacher effects with student behavior and learning outcomes was undertaken by Fox (1978). The subjects were 53 sixth grade teachers whose pupils were observed for time on-task. Fox concluded that not only does more time on-task increase performance, but learning outcomes are positively affected as well. Fox credits teacher effects for high on-task behavior.

Clearly, teacher effects seem to be an important factor in time on-task behavior. The present study controlled for this variable by having the teachers leave the room during data collection. Since the researcher was more interested in the relationship between time

off-task and performance, it was felt that the potential for teacher effects might lead to spurious results and therefore was not a factor in this study.

Student Achievement

The effect of on-task behavior and student achievement is by far the most researched area in on and off-task studies in education. This study sought to determine how time off-task affects performance which may be considered a short-term measure of achievement. Achievement is more appropriately measured over longer periods of time while performance can be measured during a shorter duration. The relationship between short-term performance and long-term achievement would certainly be an appropriate subject for study.

Rusnock and Brandler (1979) studied the percentage of off-task behavior of fourth grade students and compared it with achievement growth from the previous two years. They made 30 observations of student behavior, type of activity, off-task behavior, and activity format. Rusnock and Brandler then classified the subjects according to their records as having either high or low achievement growth (AG). They concluded that there was no difference between the two groups on off-task behavior. This suggests that off-task behavior may not be a good long range predictor of achievement. This point is well taken when one considers the fact that no longitudinal studies regarding the relationship of on and off-task behavior to achievement were discovered in the literature review. Short-term studies suggest a strong

positive relationship between high on-task behavior and high achievement; however, the test of time is the only way to confirm these short-term results.

A problem with some of the research on task orientation and achievement is that it was conducted outside of the natural classroom setting. Walker and Hops (1976) found that a high level of attending in an experimental setting resulted in significantly higher on-task performance, but the authors warn against generalizing their results to the classroom. Another study in an unnatural setting was conducted by Nottelmann and Hill (1977). They measured on and off-task behavior of individual fourth and fifth grade children as they tried to solve an anagram. The anagrams consisted of 10 jumbled letters to an unfamiliar word and were constructed to be very difficult and anxiety producing. Nottelmann and Hill (1977) concluded that high anxious children are more off-task than low anxious children. Again, generalizability is severely limited due to the sterile nature of the experimental setting.

Laffey (1980) found that the desire to be either high or low on-task oriented is related to the students' expectations of success. He observed 88 high school students for time on-task. He then compared each student's time on-task score with teacher ratings, days absent, and assignments not completed. Those students with high time on-task also had high teacher ratings, fewer days absent, and usually completed their assignments. Laffey concluded that while time on-task relates positively with the three other variables, those variables are better predictors of achievement than simply time on-task. The

message that Laffey seemed to be conveying was not to rely so much on time on-task as a predictor of future performance. Others, however, have also found that a desire to be on-task increases time on-task (Fox, 1978; Slavin, 1977).

An important school of thought regarding the observation of time on-task was begun by Cobb (1972). He raised the question that one cannot observe thinking which is a covert behavior. Since then, several researchers have attempted to take into account covert behavior during analyses of on-task observations (Anderson, 1975; Bloom, 1974; Tyler, 1950). Anderson (1975) computed time on-task by taking the average amount of overt and covert behaviors using a questionnaire of what students were thinking at a particular point during observations. With these data, Anderson had judges rate the responses to the questionnaire as being either on or off-task oriented. In this manner, it was felt that a more accurate indicator of true time on-task was being facilitated. However, several flaws did exist in Anderson's design and the arrived at estimate is questionable. The thought that covert on-task behavior does exist is part of the logic behind the present study and this researcher recognizes that probability.

There were practically no studies in this literature review that dealt with handicapped children. Samuels and Turnure (1974) raised the question as to whether or not high socioeconomic status (SES) children required as much engaged time in a specific content area as low SES children for similar achievement gains? Good and Beckerman (1978) attempted to control for the SES factor by having

subjects represented from the full range of socioeconomic status. The results they obtained on time on-task were not significant for SES nor were their data involving high, middle, and low achievers. They cited coder problems, differences in teachers, and pupil characteristics as possible confounding issues. SES still remains a variable that seems to logically have some relationship with time on-task and should be controlled when possible.

Wyne and Stuck (1979) studied time on-task and reading performance in underachieving children. They were attempting to lend empirical support to Carroll's hypothesis that time and achievement were positively related. They had an intervention group in a laboratory setting designed for observation of time on-task. Two months after the experiment which consisted of enrichment exercises to enhance time on-task, they tested the children for rates of time on-task and confirmed Carroll's theory. The intervention group retained a high time on-task ratio than the control group. Bloom (1974) referred to Carroll's model of school learning as well and postulated further than time and interest increase time on-task behavior. Carroll indicated that with enough time a child will learn a task whether or not he/she is conciously aware of attending to that task.

In summary, there seems to be a paucity of time on-task and achievement literature relating to handicapped children. Further, the results of this study suggest that more longitudinal and ethnographic data on time on-task and achievement are sorely needed.

Definition of On and Off-Task Behavior

A major problem with using time on-task as an indicator of success is defining it and observing what has been defined. Usually some form of physical movement is required to be either on or off-task. Omori (1979) gave an example of this definitional abyss. She defined on-task simply as any behavior appropriate to the work situation. Her subjects were 12 kindergarten children at the Kamehameha Early Education Project. Off-task behavior was slightly harder to define—inappropriate behavior, daydreaming, disruptions, shouting, fighting, playing, reading a book, being between tasks, waiting for the teacher, and anything done after the completion of a task. She found that high on-task children did better than low on-task children but not significantly so. In most classroom observations of on and off-task behavior, including the present study, Omori's definition of off-task would cause the results to change drastically since behaviors like waiting for the teacher and being between tasks would probably be rated as on-task rather than off-task. This problem of individualized definitions of what constitutes on and off-task behavior is a serious problem that poses threats to generalizing results found in any study. On and off-task behavioral definitions have generally been tailored to a particular setting or program.

Another definition of on-task was postulated by Grannis (1978). On-task was defined simply as goal directed and intentional. Anything else was considered off-task. Although Grannis's definition does not compensate for covert behavior such as thinking, his results

showed significant differences in favor of high on-task subjects who were intentionally goal directed. His subject population was 20 second graders and easily goal directed. This accounted for the tailored approach to operationalizing the definition of on and off-task. The Omori and Grannis studies represent the basic problem that keeps on and off-task experimentation from being reliable and/or valid (i.e., the rare occurrence that two researchers would use the same definition of on and off-task).

There are a few similar characteristics that most educational researchers use in defining what is on and off-task behavior. For instance, attending, daydreaming, doodling, eye gaze, being disruptive (Bloom, 1974; LaHaderne, 1968; Laym 1969; McDaniel, 1974; Stodolsky, 1979; Walker & Buckley, 1968; Zohn & Bornstein, 1980). These few behavioral indices were abundantly evident in this review of the literature and can be said to be fairly reliable sources of on and off-task observational definitions. However, more often than not, the behavioral categories that make up on and off-task vary widely from researcher to researcher as a function of the peculiar needs of that researcher. Nottelmann and Hill (1977) looked only at glances as measures of off-task behavior in 144 fourth and fifth grade children. LaHaderne (1968), on the other hand, had an elaborate system whereby any movement had a classification. In the former case, the off-task indicator was not enough while in the latter it was too complex. Of course, much depends on the questions of the researcher and the settings in which observation occurs, but there

does seem to be a tendency in the literature for either over-simplicity or terrific complexity.

Some researchers have attempted to standardize observational techniques (Doss & Ligon, 1979; Ligon, 1978; McDaniel, 1974). Doss and Ligon's Behavior Rating Checklist (BRC) was made up by a committee of parents and educators. It has 10 student behavior items and was tested on 1,762 kindergarten through fifth graders. The BRC operationalizes off-task behavior as any horseplay, talking during a lecture, and sleeping. This is a simple enough definition but the observer has nine other categories to contend with. It seems that to do an adequate job of assessing on and off-task behaviors in the classroom one needs a battery of observers watching a battery of behaviors. The operational definition of on and off-task behavior for this study was made up of several common indices and can be found in the definitions section of Chapter I.

Other researchers who also tried to standardize on and off-task measures have found some support from public and private funding agencies (Stallings, 1977; Stallings & Kaskowitz, 1974). The Stallings and Kaskowitz system is presently being used by the Research for Better Schools, Incorporated, in Philadelphia. This program, conducted by Huitt and Rim (1980), is attempting to put together a basic skills instructional improvement program and is using measures of on and off-task behavior. However, the Stallings and Kaskowitz definitions are rather long and much training is required to master the observational technique. An observer with little training would not be able to appropriately use this model in an ordinary classroom.

The final answer regarding defining on and off-task behaviors seems to be to fit it to a given or particular circumstance. Whatever one comes up with is probably as valid as any given in the literature. However, this leads one to wonder about results obtained and the trust that seems to be placed in time on-task as a global indicator of achievement. The present study sought to combine several common elements found in definitions of off-task behavior by researchers in the area. Some studies presented herein were structured in such a way that none of their behavioral indices could be used in the present study. However, the researcher determined that the definition presented in Chapter I was appropriately representative of the majority of on and off-task studies.

Anxiety

The last area of the literature review involving on and off-task behavior had to do with the anxiety level of students. This area has been included in the review due to the potential for a novelty effect during the study. Some subjects may exhibit highly anxious behaviors or vice-versa, and these behaviors could be explained through the literature presented. Because of the literature involving anxiety and off-task behavior, the novelty effect has a greater potential for increasing variability.

Nottelmann and Hill (1975) found a high correlation between test anxiety and off-task glances in a highly structured experimental situation. McKenzie (1979) observed effects and test-like events on

achievement and on-task behavior. His subject population was 51 third graders split into two treatment groups. In one group subjects had to respond individually while in the other group they responded in unison. He established test-like events for both groups and found that this atmosphere produced less off-task behavior. However, the short length of McKenzie's study is cited as a severe limitation.

It does appear that anxiety plays a role in on-task behavior. It is of some concern as to how anxious children become when observers enter the classroom for data collection.

Summary

On and off-task behaviors have been assumed indices of such things as good teachers, good students, successful students, at risk children, and a myriad of other such behaviors. The literature review presented here is relatively brief only by the nature of the problem. Table 1 contains a summary of the reviewed studies. While on and off-task behaviors are recognized and used in a great many studies, few researchers give a great deal of thought to operationalizing the concepts.

A more serious concern for this research is the paucity of experimental or non-experimental literature regarding on and off-task behaviors of handicapped children. Research on attention span for handicapped children does not focus on specific behaviors. There are studies such as that conducted by Zohn and Bornstein (1980) with mentally retarded adults in a sheltered workshop. In fact, many such studies exist. They were purposely left out of this literature review

because they are essentially non-academic in nature and would not realistically represent the goals of the present study. Observations of on and off-task behaviors of mildly handicapped youngsters are needed if it is to be believed that they are the same as everyone else. There is certainly evidence that educable mentally retarded and learning disabled children are often highly anxious and hyperactive (Mercer, 1979). Perhaps the present study will add some knowledge of the incidence of off-task behaviors for educable mentally retarded and learning disabled children.

Most of the existing literature involves elementary school children. This study soung to observe these behavioral indicators at the middle school level. Of the 81 references produced by the ERIC computer search, only eight of them were of studies conducted in elementary schools and only one study utilized middle school students.

Table 1

Summary of Literature Review

Author(s)	Subjects	Treatment	Measures	Results	Problems
			Teacher Effects		
Forness (1973)	106 Kindergarteners	Observed Teacher Rating Effectiveness	Self-made Observational Scale	Teachers respond to high on-task children	Minority enrollments varied greatly
Borg, Langer, & Wilson (1975)	29 Inservice Elem. Teachers	Experimental course in classroom management	Teacher and pupil Time Off-Task	No difference between groups	Only 1 hour of observation
Davidson & Bell (1975)	24 Teachers and Schools 4th, 5th, 6th		Pupil Time On-Task	Teacher behavior accounts for large part of on-task	Not specific
Fox (1978)	42 4th-6th grade rural children	30 ½ hour remedial reading with rewards	On-Task Reading Achievement	Positive relation between on-task and reading achievement	Children had to read aloud for 15 sec.

Table 1—Continued

Author(s)	Subjects	Treatment	Measures	Results	Problems
			Definition		
LaHaderne (1968)	125 6th Graders		Student Opinion Poll—Attitude Toward School Time On-Task	Dissatisfied children just as attentive	Observers in classroom
Lay (1969)	104 Disadvantaged Kindergarteners	Participation in a Program for Expressive Activities	Stanford-Binet PPVT Time On-Task	No difference in time on-task	
Cobb (1972)	1,596 4th Graders	Observation Instrument varied by complexity	Observed rates of academic achievement with time on-task	More specific equals more accurate	Observation instrument gets complex
Stodolsky (1979)	5th Grade classes in 13 Chicago School Districts	Seatwork vs. non-seatwork	Time On-Task	Seatwork is easier mark time on-task	
Zohn & Bornstein (1980)	4 mentally retarded adults, 41 yrs. old, avg. IQ = 47	Self-recording of number of kits completed	Time On-Task Work Quality Work Productivity	Self-monitoring enhances productivity	Small sample

Table 1—Continued

Author(s)	Subjects	Treatment	Measures	Results	Problems
			Achievement		
Samuels & Turnure (1974)	88 1st Graders	Regular Reading Period	Observed on and off-task	Girls did better than boys	No standardized observation instrument
Anderson (1975)	27 7th Graders 28 9th Graders	7th=1 week of divide 9th=1 week of algebraic expressions	Time On-Task	The more time on task, the better	Poor generalizability
Walker & Hops (1976)	3 Primary Groups 16 Subjects Each	Experimental Classroom	Metropolitan Achievement Test Time On-Task	Exper. Class increased appropriate behavior	Grade difference Experimental setting
Good & Beckerman (1978)	Six 6th Grade classrooms	Large vs. Small group	Time On-Task	Small group = more time on-task	Differences in coders and teachers
Rusnock & Brandler (1979)	21 4th Graders	Past Cum. Records High Ach. Growth Low Ach. Growth	Time On-Task	No difference between High AG and Low AG	
Wyne & Stuck (1979)	2nd and 3rd graders from one school	Time on-task in classroom	Time On-Task	Greater time on task in intervention room	Small sample
Laffey (1980)	88 High School Students		Teacher Ratings Days Absent Assignments not complete	Measures were best predictors of time on-task	No standardized Instrument

Table 1—Continued

Author(s)	Subjects	Treatment	Measures	Results	Problems
			Anxiety		
Nottelmann & Hill (1977)	4th and 5th from two middle class elem. schools	Two Anagram Boards 10 Letters	Visual Off-Task Glances	Negative relation between off-task and performance	Experimental setting
McKenzie (1979)	51 3rd Graders	Teach a new Concept	Time On-Task	Test-like events reduce off-task	Short treatment period

CHAPTER III

METHOD

Chapter III presents the methods, subjects, and procedures used in the study. It includes a discussion of subject selection, observer training, and data collection procedures and analyses.

Subjects

Subjects used in this study were evenly distributed between the categories of educable mentally retarded (EMR), learning disabled (LD), and Normal children as defined in Chapter I. Each group contained 10 subjects giving a total population size of 30. The subjects were middle school students aged 13-15 enrolled in four schools in the Alachua County school system. It was determined that 30 subjects would provide enough data to adequately test the null hypotheses as well as having an equal number of subjects in each group.

Subject selection was completed randomly by first identifying the ability category of the child and then referring to a table of random numbers until 10 subjects for each category were chosen. Those subjects who scored 0 or 100 percent were not considered for selection. The actual selection of subjects was completed after the data had

been collected in order to prevent researcher bias. In this case, the researcher was the instructor and, as such, sought to avoid subject identification in order to reduce the possibility of contamination.

Observers

The observers used for data collection were students in the Department of Special Education of the College of Education at the University of Florida. Prior to data collection, the observers were trained using videotapes of the classroom settings. The researcher trained the observers to identify off-task behavior and record the duration of those behaviors. The training tapes included the subjects selected for this study videotaped while engaged in a 15 minute task. These data were not included in the final analysis of the off-task data. Further, neither the observers nor the students were informed of the actual purpose of the study so as to prevent a Hawthorne effect and observer bias.

The Pearson Correlation Coefficient was used as the instrument to ascertain interrater agreement. The average rating for time off-task served as the variable measure. An interrater agreement of .80 was required by all observers for three consecutive times before data collection could begin.

Data Collection

The subjects were observed while being instructed for 15 minutes on a novel math addition task (see Table 2). Math tasks were chosen because of ease of presentation and availability of appropriate novel tasks. When a subject was viewed exhibiting off-task behavior, as defined in Chapter I, the observer started the timing and stopped it when the subject returned to task. After a 30 second observation, the total number of seconds off-task was tallied. For each instructional setting, there were 10 30-second observations totaling five minutes of observation per subject per day. Data were collected during two consecutive days yielding 10 minutes of recorded off-task behavior for each subject during the instructional phase (see Table 3). Data collection began when an audio cue was recorded on the videotape. For the instructional phase, data collection began five minutes after the phase began. The performance phase data were collected when the last paper had been passed out approximately 2-3 minutes into the phase.

The second phase of observation was directed toward the recording of student off-task behaviors while involved in doing a novel addition task. Again, 10 30-second observations on each student were conducted noting duration of off-task behavior over a two day period. The total observation time per subject was 20 minutes. All phases of the study were recorded in the subjects' own classrooms. (Refer to Appendix A for the observer form used in this study.)

Table 2

Novel Math Tasks

Day 1

This task is a mathematical algorithm which does not require the learner to add any numbers greater than 9 + 9. When two numbers are equal to or greater than 10, a line is drawn through the number to represent the tens place and the left over number in the ones place is added to the next number(s) until 10 or more is reached again. The number in the ones place at the end of the column of numbers remains in the answer. The lines in the tens places are added up and constitute the tens place in the answer.

```
   7
  ~~9~~ 6=left over from 7+8
  ~~5~~ 0+left over from 5+5
   6  6=left over from 0+6
+ ~~4~~ 0=left over from 6+0
```

Number of lines = 31 = left over from last number added

Table 2—Continued

Day 2

This task is a mathematical algorithm which enables the learner to do more than one-digit addition without carrying. The procedure is to begin from left to right adding each column and recording the answer diagonally. When all calculations are complete, the numbers remaining below the answer line are added in the traditional fashion.

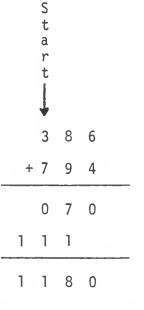


Table 3

Total Time Off-Task

Instructional Phase	
Number of Observations	20
Length of Observations	30 seconds
Total Time	10 minutes
Performance Phase	
Number of Observations	20
Length of Observations	30 seconds
Total Time	10 minutes

n = 30

Total time of observations per student = 20 minutes

These data were collected over a two day period.

Procedure

The procedure involved the researcher instructing groups of EMR, LD, and Normal subjects on the novel arithmetic task using lectures, examples, and worksheets. One class of each ability group was instructed in each of the four schools. Fifteen minutes prior to instruction the videotape machine was started and the subjects were given a worksheet consisting of simple addition problems. The 15 minute running of the videotape equipment was recommended by Reichard and Reid (1969) in order to control for a potential novelty effect. Further, data collected from the worksheets during this time provided some indication of individual subject differences in addition to skills. These data were not, however, used in the time off-task analysis.

After 15 minutes the researcher began instruction on the novel arithmetic task. Instruction was defined in Chapter I as the action, practice, or profession of a teacher utilizing examples over a period not to exceed one-half hour. Due to the fact that subjects' schools were on 50 minute instructional periods, the instructional phase was limited to 15 minutes.

During the final 15 minutes of the data collection period the subjects were asked to perform a paper and pencil task oriented to the instruction given. Forty-five problems were given as the task to insure the likelihood that no student would finish before 15 minutes had elapsed.

The above procedures were completed twice in each class for two consecutive days. The instruction varied by using different

examples and the tasks had new, but comparable, problems. The rest of the procedure on the second day was held constant.

Data Analysis

It was the purpose of this study to determine whether or not a relationship exists between time off-task and the quality of performance of students engaged in a novel arithmetic task using conventional measures and definitions of off-task. To test the first research hypothethis in this study a multiple regression analysis was employed. For the split-plot ANCOVA procedure, the independent variable was time off-task and the dependent measure was performance. The statistical model (see Table 4) includes IQ, ability, and time off-task. Three possible interactions were included in the model. They are IQ with time off-task, ability group with time off-task, and a possible three-way interaction among IQ, time off-task, and ability group. The final component of this model controls for error. The hypothesis that was tested through this analysis is stated in the null form as

Ho: There is no relationship between time off-task and performance.

The other questions of the study, as reported in Chapter I, are:

(1) Will off-task behaviors differ during the performance and instructional phases?

Table 4

Model for First Hypothesis

Ho: There is no relationship between time off-task and performance.

Independent Variable: Time Off-Task

Dependent Variable: Percent Correct

Data are analyzed using multiple regression techniques.

Statistical Model:

$$Y=ax1 + bx2 + cx3 + dx1x3 + ex2x3 + fx1x2x3 + error$$

Where:

- Y = Performance score
- ax1 = IQ
- bx2 = Ability group (i.e., EMR, LD, Normal)
- cx3 = Time Off-Task
- dx1x3 = Interaction Between IQ and Time Off-Task
- ex2x3 = Interaction Between Ability Condition and Time Off-Task
- fx1x2x3 = Three Way Interaction Among All Variables
- error = Naturally Occurring Statistical Error

---

(2) Will time off-task differ between the ability groups used in the study?

To answer these questions statistically, a 3x2 repeated measures ANOVA was employed. That is, the three levels of ability groups (i.e., EMR, LD, and Normal) were compared with time off-task during instructional and performance phases. Eight hypotheses were tested by this design. They were

2. Ho: There will be no interaction between ability group and phase (i.e., instruction or performance phases).
3. Ho: There will be no difference between time off-task for subjects during instruction and during performance.
4. Ho: There will be no difference between time off-task during performance for subjects in EMR, LD, and Normal groups.
5. Ho: There will be no difference between time off-task during instruction for subjects in EMR, LD, and Normal groups.
6. Ho: There will be no difference between time off-task for subjects in Normal, EMR, and LD groups.
7. Ho: There will be no difference between time off-task for subjects in the Normal group between instruction and performance phases.
8. Ho: There will be no difference between time off-task for subjects in the EMR group between instruction and performance phases.

9. Ho: There will be no difference between time off-task for subjects in the LD group between instruction and performance phases.

The dependent variable in testing the above hypotheses was the number of seconds off-task and the independent variables were ability group and phase off-task (i.e., either during instruction or performance phases). Table 5 presents this design in graphic detail.

Table 5

Design for Hypotheses 2-9

3x2 Repeated Measures ANOVA

	Off-Task Instruction	Off-Task Performance
Normal		
EMR		
LD		

CHAPTER IV

RESULTS

The results obtained through data analysis are presented in this chapter. The interpretation of these results will be presented in Chapter V. Data for analysis were obtained through videotape observations of off-task behavior and through scores on a performance measure. Further analyses were made pertaining to Day 1 and Day 2 as well as phase (i.e., instructional or performance). Finally, comparative results are reported relative to the ability groups of EMR, LD, and Normal students who served as subjects for this study.

To determine whether or not a relationship exists between time off-task and performance, a split-plot analysis of covariance (ANCOVA) was utilized. This technique assumes that the populations are normally distributed, that observations were based on representative random samples, that variances of populations are equal, and that observations were made independently. Time off-task was treated as the independent variable and performance was the dependent measure. The ANCOVA procedure is designed to hold a variable statistically constant for subjects. In this study, the covariate taken into consideration was IQ. The statistical model referred to in Chapter III

(see Table 4) includes three possible interactions: IQ with time off-task, ability group with time off-task, and a possible three way interaction among IQ, time off-task and ability group. These interactions were explored using the split-plot ANCOVA procedure. To test for significance the Bonferroni t-test was used.

The other questions this study sought to answer are presented in the null form in Chapter III (pages 36-37). These hypotheses were tested using a 3x2 repeated measures analysis of variance (ANOVA). The ANOVA procedure is based on the same assumptions as ANCOVA, but without considering any one variable as was done with IQ.

Observer agreement was checked both before and during the study. The procedure was a simple correlation between observers' judgments of seconds of off-task behavior for a subject during a five minute timing. The five minute timing was broken down into 10 second intervals thereby providing 30 individual observations per timing. There were three observer checks prior to data collection and three during data collection. Results of inter-observer agreement checks are reported in Table 6.

All nine hypothesis tests were made at the .05 level of significance. Both between group and within group variances were studied to determine whether or not any significant main effects existed.

Table 6

Inter-Observer Agreement
(Overall)

Observer	1	2	3
1	1.0000	.9110	.9055
2	.9110	1.0000	.9208
3	.9055	.9208	1.0000

Analysis of Data for First Hypothesis

Ho: There is no relationship between time off-task and performance. The question of whether or not a relationship exists between time off-task and performance was approached through correlational and multiple-regression analyses. The correlational data clearly support the null hypothesis that no relationship exists. The only relationship detected in this manner occurred between the performance measure on Day 2 and off-task behavior during the performance phase. These data are presented in Table 7.

The first step in the multiple regression analysis of this hypothesis was to test for parallel slopes. The data revealed no significant interactions. It, therefore, is assumed that the slopes are parallel. Secondly, an examination of the residual plots (within group variance) shows the data to be normally distributed with no clear trend. Following the examination of residual plots, the

Table 7

Correlational Data for First Hypothesis

Day 1			
	Off-Task Instruction	Off-Task Performance	Off-Task Total
P1	.03581 Prob. > .8510	-.24076 Prob. >.2000	-.20110 Prob.>.2866

Day 2			
	Off-Task Instruction	Off-Task Performance	Off-Task Total
P2	.00308 Prob. > .9871	-.38978* Prob. > .0332	-.29193 Prob. > .1175

*Significant cell

researcher checked for interactions among group, phase, and the off-task measures (i.e., during instruction, performance, and total time off-task). No significant interactions were discovered. Again, these data support the null hypothesis and reveal that the statistical model described in Table 4 in Chapter III was a poor predictor of performance. These data are reported in Table 8.

Table 8

Data for First Hypothesis

Day 1

Dependent Variable: Performance

Mean Square Error: 240.368 DF: 21

Overall F	Significance of F	R-Square
2.21	.069	.46

Source	DF	Sum of Squares	F	Significance of F
Group	2	933.81	1.94	.17
Off-Task	1	95.45	.40	.54
IQ	1	50.54	.21	.65
Off-Task (Group)	2	274.17	.57	.57
IQ (Group)	2	1539.73	3.20	.06

$p < .05$

Table 8—Continued

Day 2				
Dependent Variable:	Performance			
Mean Square Error:	375.29	DF: 21		
Overall F	Significance of F		R-Square	
1.93	.11		.42	
Source	DF	Sum of Squares	F	Significance of F
Group	2	138.78	.18	.83
Off-Task	1	112.98	.30	.59
IQ	1	84.62	.23	.64
Off-Task (Group)	2	67.69	.09	.91
IQ (Group)	2	70.50	.09	.91

$p < .05$

Data Analysis for Other Hypotheses

This analysis followed a similar pattern to that of the first hypothesis. First, a test for two-way interactions was made. This test revealed that an interaction did not exist and that the slopes were parallel. The researcher examined the data with both a split-plot ANOVA and ANCOVA in order to ascertain the more sensitive procedure; the ANOVA was decided upon. As with the earlier analysis,

the residual plots revealed normal distribution of the data with no clear trend.

Second Hypothesis

Ho: There will be no interaction between ability group and phase (i.e., instruction of performance phases). A significant interaction was found between ability groups and the type of time off-task (i.e., during instruction or performance). The calculated F exceeded the critical value produced by the Bonferroni t-test. The null hypothesis was rejected. These data are presented in graphic detail in Table 9.

Table 9

Data for Second Hypothesis

Dependent Variable: Off-Task Score

Mean Square Error: 408.35 DF: 27

Overall F	Significance of F	R-Square
1.63	.09	.66

Source	DF	Sum of Squares	F	Significance of F
Group	2	8623.30	10.56	.0004*
Phase	1	198.02	.48	.49
ID (Group)	27	8053.13	.76	.76
Group * Phase	2	4166.03	5.10	.01*

Bonferroni t-test statistic = 3.26

$p < .05$

Third Hypothesis

Ho: There will be no difference between time off-task for subjects during instruction and during performance. Although a significant difference between time off-task scores during performance was detected for the EMR group, there was no difference for the LD and Normal groups (see Table 10). Further, there were no significant differences for the instructional phase, preventing rejection of the null hypothesis. This indicates that an interaction exists and that there are no overall main effects for phase.

Fourth Hypothesis

Ho: There will be no difference between time off-task during performance for subjects in EMR, LD, and Normal groups. A significant difference was detected between groups and time off-task during the performance phase. Table 10 describes the data and reports the Bonferroni t statistic. It must be noted that since this is a follow-up procedure, the mean square error term for the Bonferroni test was taken from the main analysis. Since the Bonferroni t value failed to exceed the computed value, there is a significant difference between the group means for the performance phase. This follow-up procedure enabled the researcher to pinpoint the exact location of the difference mentioned in the immediately previous hypothesis section.

Fifth Hypothesis

Ho: There will be no difference between time off-task during instruction for subjects in EMR, LD, and Normal groups. Although the

Table 10

Data for Hypotheses Three, Four, and Five

Instructional Phase				
Dependent Variable: Off-Task				
Mean Square Error: 254.51 DF: 26				
Overall F		Significance of F		R-Square
.54		.66		.05
Source	DF	Sum of Squares	F	Significance of F
Group	2	205.62	.40	.67
IQ	1	6.21	.02	.88
Performance Phase				
Dependent Variable: Off-Task				
Mean Square Error: 462.60 DF: 26				
Overall F		Significance of F		R-Square
9.45		.0002		.52
Source	DF	Sum of Squares	F	Significance of F
Group	2	3374.44	3.65	.04*
IQ	1	726.90	1.57	.02

Bonferroni = 3.23

$p < .05$

location of the difference of time off-task between groups was detected in the last hypothesis test, proper statistical procedure dictates that this test be performed in order to confirm the results. As Table 10 shows, the researcher failed to reject this hypothesis thereby providing the necessary confirmation.

Sixth Hypothesis

Ho: There will be no difference between time off-task for subjects in Normal, EMR, and LD groups. Again, the data show that a difference does exist between the ability groups and time off-task, but only during the performance phase (see Table 11). Therefore, the researcher rejects this hypothesis and assumes no main effects for group as a result of interactions. In order to determine the exact location of the differences, simple main effects were examined. They are presented as follow-up hypotheses.

Seventh Hypothesis

Ho: There will be no difference between time off-task for subjects in the Normal group between instruction and performance phases. While the second hypothesis was not rejected, it was noted that it did not hold true for all groups. In order to ascertain the group of groups for which it did not hold true, this and the following hypothesis tests were conducted. Again, these are confirmatory tests in order to ascertain the location of simple main effects. The test for the normal group led this researcher to the position of acceptance of the null hypothesis indicating that the difference mentioned earlier is manifested in either the EMR or LD groups (see Table 11).

Table 11

Data for Hypotheses Six, Seven, Eight, and Nine

Dependent Variable: Off-Task

EMR GROUP

Source	DF	Sum of Squares	F	Significance of F
Phase	1	3699.2	9.05	.05*
IQ	9	6653.2	.68	.7

Bonferroni = 4.34

p .05

LD GROUP

Source	DF	Sum of Squares	F	Significance of F
Phase	1	352.80	.86	.24
IQ	9	897.80	2.39	.10

NORMAL GROUP

Source	DF	Sum of Squares	F	Significance of F
Phase	1	312.05	.76	.53
IQ	9	801.45	.89	.56

Eighth Hypothesis

Ho: There will be no difference between time off-task for subjects in the EMR group between instruction and performance phases. The results of this analysis are reported in Table 11. As the data show, the significant simple main effects for time off-task between the instructional and performance phases are evident for the EMR group. Therefore, the null hypothesis is rejected indicating that the EMR group is the only group to show time off-task differences between the two phases.

Ninth Hypothesis

Ho: There will be no difference between time off-task for subjects in the LD group between instruction and performance phases. This final hypothesis test confirms the data presented in the previous hypothesis. Since the EMR group appears to represent a significant difference, this test is necessary to assure that it is the only difference. The data failed to reject this hypothesis thus confirming that only one group showed significant off-task differences between the instruction and performance phases (i.e., EMR).

Summary of Findings

Data were analyzed using two statistical techniques. To test the first main hypothesis a split-plot ANCOVA regression procedure was utilized. A significance level of .05 was used to test all hypotheses in this study. The second statistical procedure incorporated a 3x2 repeated measures ANOVA and addressed eight

hypotheses including both main and simple main effects analyses. Table 12 and Figure 1 present a summary of these data. (Raw data can be found in Appendix B.)

Table 12

Summary Table

Directionality Results	
EMR =	Group 1
LD =	Group 2
Normal =	Group 3

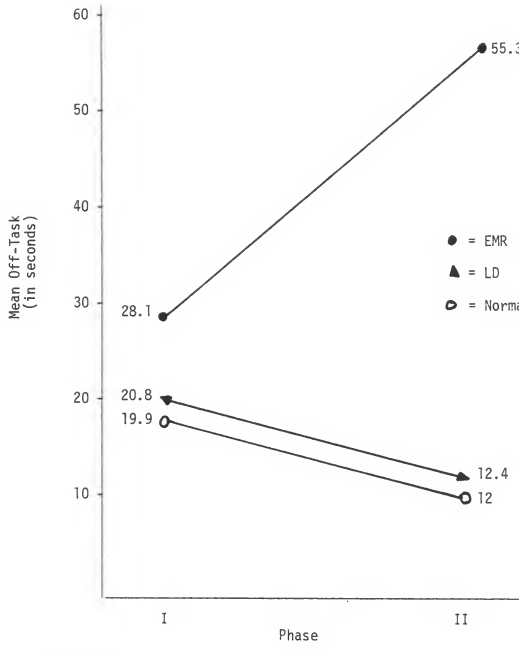
Parameter	Estimate
Group 1	25.369
Group 2	- 7.375
Group 3	0.000

Group 1 minus Group 2	=	33.93 > 25.50
Group 1 minus Group 3	=	51.92 > 25.50
Group 2 minus Group 3	=	32.73 > 25.50

Bonferroni = 25.50

p .05

Conclude: There is a significant difference between means.



I = Instructional

II = Performance

Figure 1

Display of Mean Differences by Group and Phase

CHAPTER V

DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

Discussion

Nine hypotheses were addressed in this study. The first hypothesis was analyzed using a split-plot ANCOVA procedure. The remaining eight hypotheses underwent the scrutiny of a 3x2 repeated measures ANOVA. The total number of subjects was 30 representing three ability groups (i.e., EMR, LD, Normal). Each ability group had 10 subjects randomly selected from a total pool of 209 students. This process helped assure representativeness of the sample as well as providing the researcher with an equal number of subjects within cells. As stated in Chapter IV, the residual plot analysis confirms representativeness of the sample.

A parent permission form was signed by each subject's parent or parents, a copy of which may be found in Appendix C. Any child without a signed parent permission form was exempt from any part of the study particularly the videotaping. The researcher did not keep a record of those students who failed to provide parental permission. Subject attrition accounted for the loss of only two subjects in all three groups leaving an adequate number from which to randomly select and to serve as subjects for data analysis.

Subjects were selected from the middle school population of Alachua County and ranged in age from 13 to 15. Sex of subjects was not a consideration of this study and, therefore, underwent no statistical analyses. Intelligence Quotient (IQ), on the other hand, was a component of the statistical model and served as a covariate in the analysis. IQ proved to be an adequate covariate and tended to even the three ability categories.

Data were collected via videotapes of the subjects during the instruction and performance phases of the study. Three independent observers noted off-task behavior as defined in Chapter I. Inter-observer agreement was calculated and is presented in Table 6 in Chapter IV. The percent of agreement for all observers was beyond the .90 level and therefore served as a legitimate means of data collection.

Variables under analysis were (a) time off-task, (b) performance, (c) ability groups, (d) phase, and (e) day. Time off-task was reported as seconds of off-task behavior during a five minute observation. Four five minute observations were made for each subject, one during each of two phases covering two days. Performance is a score consisting of the percent correct on each of two performance worksheets. As noted previously, the three ability groups were EMR, LD, and Normal. The variable phase refers to one of two phases during the study (i.e., instruction or performance). The variable day refers to either day one or day two of the study. The reader is referred to Chapter I for a more complete explanation of these variables.

First Hypothesis

This hypothesis states that there is no relationship between time off-task and performance. The statistical test of this question resulted in a failure to reject the hypothesis. Further, correlational data reveal the same results and are reported in Table 7 in Chapter IV. Upon closer examination of the correlational data, the reader may note that a correlation of -.38 is significant at the .05 level between performance and off-task behavior during performance for day two. Those data suggest that during day two off-task behavior during the performance phase is a good predictor of performance. Since the coefficient is negative, it is further suggested that as off-task behavior during the day two performance phases increased, performance decreased. However, the reported correlation coefficients were considered to be low indicating a weak relationship at best.

Although a relationship does appear to exist between time off-task and performance as stated above, the relationship appears in only one of six measures. In light of this fact, it would be inappropriate and incorrect to reject the overall null hypothesis.

The split-plot ANCOVA regression procedure confirms the results suggested by the correlational data. No significant differences were found between time off-task and performance except during day two when off-task behavior during the performance phase differed with the performance measure. These are the exact results reported by the correlational data.

These results may seem surprising in view of the literature that suggests that off-task behavior and performance are related (Carroll, 1963; Laffey, 1980; Walker & Hops, 1968). However, Rusnock and Brandler (1979) suggest that off-task behavior may not be a good long range predictor of achievement.

One possible explanation for this result could be a novelty effect. The subjects of the study were subjected to a new teacher teaching new concepts with video camera recording the procedure. The probability of a novelty effect increases when one considers that a relationship between time off-task and performance did occur during the last phase of the second day. However, the only sound way of answering this question would be through a longitudinal study. Rusnock and Brandler (1979) studied off-task behavior with achievement over a two year period and found off-task behavior to be a poor predictor of achievement. Further, the researcher in this study made every attempt to reduce the novelty effect. For instance, the camera was left running for 15 minutes at the beginning of each session in order to reduce the novelty effect as suggested by Reichard and Reid (1969). Also, the researcher was a familiar figure to most of the subjects through his frequent contacts with the public schools. Finally, the novel math task was necessary in order to take into consideration previous math experience which might give one group an unfair advantage over the others.

Although a novelty effect does serve as a possible explanation for the differences, when one considers the above explanations that

effect seems minimal at best. Therefore, failure to reject the null hypothesis is most likely the correct procedure.

Second Hypothesis

The second hypothesis stated in the null form is:

Ho: There will be no interaction between ability group and type of time off-task (i.e., instruction or performance).

In rejecting this hypothesis, the analysis revealed a significant ordinal interaction between ability group and type of time off-task. In order to determine if there was a difference for each phase, a test for simple main effects was used. The simple main effect analysis indicated that there was a significant group difference during the performance phase. This suggests that the three groups, EMR, LD, and Normal, are all significantly different from each other during the performance phase (see Figure 1). Further, the directionality of the data were clearly evident indicating that the EMR group was more off-task during the performance phase than either the LD or Normal groups. Secondly, the LD group was more off-task during this phase than the Normal group. A summary presentation of these data can be found in Table 12.

It must be noted that while the directionality revealed by the above data was expected, the measure of difference is observed off-task behavior. That is, since no difference was detected for the first hypothesis that no relationship exists between time off-task and performance, the length of off-task behavior is not a good

predictor of performance. This would support the idea of covert thinking as introduced by Cobb (1972). His premise was that thinking could not be observed and therefore could lead to high observed off-task behavior as when a child appears to be off-task and instead is considering a solution to the problem at hand. More simply and specifically, these data do not show a significant relationship between time off-task and performance for either EMR, LD, or Normal subjects. Therefore, even though the mean off-task scores are considerably higher for EMR subjects, it still does not predict performance. At this point, it is fair to note that the grading of the performance measure was completed using a percent correct technique that would not penalize the lower IQ group. It is recognized that differences in IQ will lead to a disproportionately wide range of scores in favor of the normal group and LD group. Therefore, the grading procedure used was an attempt to even these differences.

Third Hypothesis

The third hypothesis stated in the null form is:

Ho: There will be no difference between mean off-task scores for subjects during instruction and during performance.

The data fail to reject this null hypothesis due to the interaction discovered in the test for linearity. As tests of later hypotheses will reveal, this hypothesis does not hold true for all groups. However, since the stated hypothesis included all groups, the

significance of just one is not strong enough evidence to reject the hypothesis.

The group that showed significance between mean time off-task scores for subjects during instruction and during performance was the EMR group. This confirmed the directionality results of the previous hypothesis that the EMR group was significantly more off-task than the LD and Normal groups.

Fourth Hypothesis

The fourth hypothesis stated in the null form is:

Ho: There will be no difference between time off-task during performance for subjects in EMR, LD, and Normal groups.

The analysis of this hypothesis revealed a significant difference between groups during the performance phase. Therefore, the researcher rejected the null hypothesis.

In comparing the calculated F value with the critical value produced by the Bonferroni t-test (see Table 10, Chapter IV), a significant difference is detected. In the computation of the Bonferroni statistic, the mean square error term was taken from the full model printout for this analysis. This approach was taken due to the fact that this analysis was a follow-up to determine in what phase the difference in time off-task occurred. In this instance, correct statistical procedure was to use the full model mean square error.

Fifth Hypothesis

The fifth hypothesis stated in the null form is:

Ho: There will be no difference between time off-task during instruction for subjects in EMR, LD, and Normal groups.

This is the second follow-up test to determine simple main effects indicated in hypothesis four. The test of this hypothesis serves only to confirm the previous hypothesis where the location of the difference was determined to occur during the performance phase. As mentioned in Chapter IV, although this hypothesis seems unnecessary, it is statistically correct to test for it.

Sixth Hypothesis

The sixth hypothesis stated in the null form is:

Ho: There will be no difference between time off-task for subjects in Normal, EMR, and LD groups.

This hypothesis was not rejected dur to the interaction found between group and phase (see Table 11). As was the case with the previous hypothesis, if the hypothesis is not true for all groups and phases, then it cannot be accepted. The interaction mentioned earlier is the cause for failure to reject the null hypothesis. Since this means that there is no overall main effect for group, the next step is to look at the simple main effects in order to detect where the difference occurs. The following three hypotheses examine the simple main effects.

Seventh Hypothesis

The seventh hypothesis as stated in the null form is:

Ho: There will be no difference between time off-task for subjects in the Normal group between instruction and performance phases.

This hypothesis and the next two hypotheses are follow-up tests to determine the location of the difference revealed in testing hypothesis three. For the Normal group, the researcher failed to reject the null hypothesis indicating that the difference is within the LD or EMR populations.

Eighth Hypothesis

The eighth hypothesis as stated in the null form is:

Ho: There will be no difference between time off-task for subjects in the EMR group between instruction and performance phases.

The Bonferroni critical value as well as the computed values are presented in Table 11 in Chapter IV. This analysis shows that there is a difference in time off-task in the EMR group between the instruction and performance phase. As such, this shows that the EMR group is the only group that exhibits significantly different off-task behavior scores between phases. One might conclude from these data that the EMR children in this study might be greatly off-task during instruction and then be very much on-task during performance.

This difference between the EMR group and the other ability groups could suggest that the difference is due to the ability group

itself. Perhaps EMR children are more distractable or frustrated than children in the other groups. These traits could lead to high avoidance or off-task behavior. A possible explanation for this result could be in the difficulty of the performance measure. Even though the rationale behind using a novel task was to overcome previous knowledge advantage, it seems logical to assume that the normal and LD children would learn the material faster and with less frustration and anxiety than the EMR children. As some researchers have shown, anxiety seems to have some relationship to off-task behavior (McKenzie, 1979; Nottelmann & Hill, 1977). In the case of the EMR student, it may be conjectured that a significant degree of anxiety over having to learn a completely novel task and then complete a performance measure on that task with only 15-20 minutes of instruction existed. Indeed, the raw data on the performance measure indicate that the EMR subjects completed far fewer problems than subjects in either of the other two ability groups. Although ability certainly accounts for some difference, it might be that anxiety also plays a significant role.

Ninth Hypothesis

The ninth hypothesis as stated in the null form is:

Ho: There will be no difference between time off-task for subjects in the LD group between instruction and performance phases.

Again, testing this hypothesis is only a formality since the interaction was discovered to occur in the EMR condition. It does

confirm those results as the researcher failed to reject the ninth hypothesis.

Implications

The findings of this study lend support to the following implications:

1. Off-task behavior was not found to be significantly related to performance regardless of ability group.
2. EMR subjects showed significantly higher off-task behavior during performance than either the LD or Normal subjects.
3. LD subjects exhibited slightly higher off-task behavior than did Normal subjects.

Conclusions

Off-task behavior was observed and recorded for subjects in EMR, LD, and Normal groups. Further, a performance measure was administered and scored and compared to time off-task during each of two phases: instruction and performance. These data tend to support the conclusion that no relationship exists between time off-task and performance. Three of the nine hypotheses tested were rejected with significant differences being found between time off-task for EMR subjects and time off-task for subjects in the other ability groups.

The idea presented in Chapters I and II regarding covert thinking (Cobb, 1972) was given some support through these data analyses. It may be a frequent error of observation to record a student off-task when, in fact, he/she is thinking about a solution to the problem.

The present study found very little difference between the time off-task scores for subjects between schools. This is a surprising result in that the schools were different in other ways. For instance, one school was an open-classroom school while the others were more structured. The researcher expected to find much more time off-task in the open classroom school and yet did not. These results were not analyzed further but certainly contain elements for future research.

Since the data revealed higher off-task scores when a subject was doing the performance measure, a question of the validity of seatwork arises. Does too much seatwork lead to decreased attending or does it stimulate creative thinking? These are questions that future studies should seek to answer.

Potential sources of contimination of data were presented and include a potential novelty effect as well as difficulty of material which was seen to favor one group over another. However, sufficient controls were employed in order to minimize the above effects.

Recommendations

1. Replication of this study is needed due to the lack of sufficient literature.
2. Replications need to be undertaken at other grade levels as well as other locations in order to improve generalizability of results.

3. A more unified effort at operationalizing the definition of off-task behaviors is needed.
4. More research is needed to help determine why EMR children appear to manifest more off-task behavior than LD or Normal children.
5. More ethnographic and longitudinal data are needed regarding off-task behavior and performance.
6. Replication using a different type of task is needed.

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APPENDIX A

OBSERVER FORM

Subject	DAY 1		DAY 2	
	Instructional Phase	Performance Phase	Instructional Phase	Performance Phase

APPENDIX B

RAW DATA

Average Duration of Time Off-Task

Day 1

Subject	Instructional	Performance	# Completed/ # Correct	Score (% Correct)
1	5	4	11/14	26
2	25	88	19/17	89
3	22	115	9/ 7	71
4	7	103	9/ 7	78
5	55	20	17/16	94
6	5	38	38/31	79
7	3	61	27/26	96
8	3	30	35/23	66
9	21	76	20/ 4	20
10	49	68	29/26	90
11	19	3	20/17	80
12	22	4	33/32	97
13	9	8	45/43	96
14	5	22	19/18	95
15	22	29	45/37	82
16	8	4	40/34	87

Day 1

Subject	Instructional	Performance	# Completed/ # Correct	Score (% Correct)
17	15	36	25/21	84
18	17	5	25/23	92
19	25	46	25/23	92
20	10	8	25/23	92
21	22	6	39/26	64
22	5	1	45/38	84
23	24	1	45/38	84
24	19	4	35/34	97
25	1	19	50/49	98
26	14	8	47/46	98
27	7	44	45/42	93
28	15	5	45/41	91
29	8	14	45/43	96
30	10	25	45/43	96

Day 2

Subject	Instructional	Performance	# Completed/ # Correct	Score (% Correct)
1	41	0	34/31	91
2	25	69	15/ 8	53
3	33	80	4/ 3	75
4	20	90	12/ 5	42
5	131	16	20/12	60
6	22	23	34/25	74
7	22	66	18/14	80
8	4	10	40/ 2	5
9	41	58	20/ 6	30
10	23	86	24/18	75
11	48	24	20/18	85
12	21	3	26/18	69
13	26	2	38/37	97
14	58	20	15/14	93
15	5	10	39/32	82
16	22	1	40/35	88
17	19	1	20/18	90
18	13	1	20/19	95
19	25	12	20/18	90
20	21	3	20/19	95
21	24	5	32/26	81
22	16	0	40/35	88

Day 2

Subject	Instruction	Performance	# Completed/ # Correct	Score (% Correct)
23	35	12	40/32	80
24	15	2	35/31	89
25	40	1	40/24	60
26	48	28	40/39	98
27	4	25	25/17	69
28	9	0	40/37	93
29	36	10	36/34	94
30	42	25	40/39	98

Average Duration of Time Off-Task

Day 1 and Day 2

Subject	Instruction	Performance	Score (% Correct)	IQ	Group
1	46	4	78	68	EMR
2	50	157	76	46	EMR
3	55	195	77	48	EMR
4	27	193	52	57	EMR
5	186	36	76	68	EMR
6	27	61	76	68	EMR
7	25	127	89	64	EMR
8	7	40	32	67	EMR
9	62	134	25	81	EMR
10	72	154	83	75	EMR
11	67	37	82	74	LD
12	43	7	85	98	LD
13	35	10	96	87	LD
14	63	42	94	84	LD
15	27	39	82	86	LD
16	30	5	87	81	LD
17	34	37	87	87	LD
18	30	6	93	79	LD
19	50	58	91	94	LD
20	31	11	93	94	LD
21	46	11	72	75	NOR

Day 1 and Day 2

Subject	Instruction	Performance	Score (% Correct)	IQ	Group
22	21	1	86	113	NOR
23	59	13	82	86	NOR
24	34	6	93	110	NOR
25	41	20	81	125	NOR
26	62	36	98	108	NOR
27	11	69	84	94	NOR
28	23	5	92	106	NOR
29	44	24	95	110	NOR
30	52	50	97	107	NOR

EMR - 557 (Inst)	EMR - 1101 (Perf)	up 544
LD - 410 (Inst)	LD - 242 (Perf)	down 168
NOR - 393 (Inst)	NOR - 235 (Perf)	down 158

Off-Task Means Table

		Instruction	Performance	Total
EMR	N	10	10	20
	$\bar{x}$	28.10	55.30	41.70
	SD	24.78	34.76	35.53
LD	N	10	10	20
	$\bar{x}$	20.80	12.40	16.60
	SD	7.28	9.41	9.25
NORMAL	N	10	10	20
	$\bar{x}$	19.90	12.00	15.95
	SD	8.31	10.96	10.30
TOTAL	N	30	30	60
	$\bar{x}$	22.93	26.57	24.75
	SD	15.57	29.44	23.42

Mean Performance Scores

		Instruction	Performance	Total
EMR	N	10	10	10
	$\bar{x}$	71.9	58.5	66.4
	SD	24.7	25.7	21.6
LD	N	10	10	10
	$\bar{x}$	89.7	88.4	89
	SD	5.89	8.1	4.9
NORMAL	N	10	10	10
	$\bar{x}$	90.1	85	88
	SD	10.3	12.3	8.1

Least Square Means When IQ Is Controlled

Group	Performance	
	Day One	Day Two
EMR	70.27	52.96
LD	91.26	90.60
Normal	90.17	88.35

APPENDIX C

PARENT PERMISSION FORM

Dear Parent:

I am a doctoral student at the University of Florida and am presently working on my dissertation. I need to collect information about pupil learning styles by videotaping classes in session.

Your son or daughter will be in one of the videotaped classes, which will not be altered in any way and I must have parental permission to use the videotapes. The tapes will be viewed by observers who will not know the names of the students and/or any other information regarding them. After the observation of the videotapes, they will be destroyed. All children taped will remain anonymous since I am more interested in how children learn than in who they are.

Please help me by signing this permission form.

Sincerely,

Scott Sparks

I hereby give my permission for Scott Sparks to videotape and have access to achievement and aptitude scores for my son/daughter for the purposes of this study.

Signed _____

BIOGRAPHICAL SKETCH

Scott Steven Sparks received his high school diploma in 1968 from Dunnellon High School, Dunnellon, Florida. From 1968 to 1970 he attended Central Florida Community College in Ocala, Florida, and was awarded an Associate of Arts degree. He received his B.A. degree in special education in March, 1973, from the University of South Florida in Tampa, Florida. In August, 1978, he graduated from the University of South Florida with an M.A. degree in special education.

From 1973 to 1975, Scott Sparks taught ninth grade educable mentally retarded (EMR) students in Charlotte, North Carolina. In 1976, he moved to Tampa, Florida, where he taught ninth grade EMR students for three years and 5-7 year old trainable retarded (TMR) students for one year. In September, 1979, he moved to Gainesville, Florida, to begin his doctoral program at the University of Florida.

During his career, Sparks has been active in several professional organizations and continues to remain so. He has served in a number of offices and on a variety of committees including two years as the southeastern member on the Board of Directors for the National Council for Exceptional Children—Mental Retardation Division.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

William R. Reid, Chairman
Professor of Special Education

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Robert F. Algozzine
Associate Professor of Special Education

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Linda Lamme
Associate Professor of General Teacher Education

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Cecil D. Mercer
Professor of Special Education

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Cary L. Reichard
Associate Professor of Special Education

This dissertation was submitted to the Graduate Faculty of the Department of Special Education in the College of Education and to the Graduate Council, and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

August, 1981

Dean, Graduate School